EARLY ONSET SCHIZOPHRENIA: A COMPARATIVE STUDY OF CLINICAL FEATURES AND PREMORBID FUNCTION WITH ADULT ONSET GROUP

Dissertation submitted to the

TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

in part fulfillment of the requirements for

M.D (PSYCHIATRY)

BRANCH XVIII

MARCH 2007

MADRAS MEDICAL COLLEGE

CERTIFICATE

This is to certify that the dissertation titled **"EARLY ONSET SCHIZOPHRENIA: A COMPARATIVE STUDY OF CLINICAL FEATURES AND PREMORBID FUNCTION WITH ADULT ONSET GROUP"** is the bonafide original work of DR. DEEPA .V in part fulfillment of the requirements for M.D. Branch – XVIII (Psychiatry) Examination of the Tamilnadu DR. M.G.R Medical University to be held in March 2007. The Period of study was from November 2005 to August 2006.

THE DIRECTOR,
INSTITUTE OF MENTAL HEALTH,
CHENNAI-10

THE DEAN
MADRAS MEDICAL COLLEGE.
CHENNAI – 3

DECLARATION

I, **DR. DEEPA .V ,** solemnly declare that dissertation titled **"EARLY ONSET SCHIZOPHRENIA: A COMPARATIVE STUDY OF CLINICAL FEATURES AND PREMORBID FUNCTION WITH ADULT ONSET GROUP"** is a bonafide work done by me at The Institute Of Mental Health, Chennai during November 2005- August 2006 under the guidance and supervision of Prof. M. Murugappan,M.D.,D.P.M., Professor of Psychiatry, Madras Medical College.

This dissertation is submitted to Tamilnadu DR. M.G.R Medical University towards part fulfillment of requirements for the award of **M.D. Degree (Branch – XVIII) in Psychiatry.**

Place : Chennai.

Date :

(Dr. DEEPA V)

ACKNOWLEDGEMENTS

I thank **Prof Kalavathy Ponniraivan**,**M.D.,** Dean, Madras Medical College for permitting me to conduct this study.

I owe my thanks to **Professor Dr.M.Murugappan**,**M.D.,D.P.M.,** Director, Institute of Mental Health, Chennai for his encouragement, immeasurable help and guidance.

I thank Professor **Dr.S.Nambi,M.D.,D.P.M.,** Additional Professor, Institute of mental Health for having guided and encouraged me throughout this study.

I thank Professor **Dr.N.Vijaya**,**M.D.,D.P.M.,** Deputy Superintendent, Institute of Mental Health for her valuable advice and help.

My immense thanks to Assistant Professor **Dr.M.Malaiappan,M.D.,** for his help and valuable suggestions.

My sincere thanks to all the Professors and Assistant Professors of the Institute of Mental Health for their valuable suggestions.

I thank all the patients and their relatives, without whose participation the study would not have been possible.

INDEX

INTRODUCTION

Schizophrenia is a devastating chronic disorder that typically presents in early adult life. Clinicians are circumspect about making this ominous diagnosis in children and adolescents. The relative rarity of the disorder in this age group together with atypical presentations complicate the picture further.

Over the past decade research activity in children and adolescents has been sparked by several factors .Awareness of the greater clinical severity of Schizophrenia in childhood and adolescence and the possibility of greater etiological liability have encouraged researchers to investigate genetic and neurobiological correlates in early onset cases(Jacobsen and Rapoport,1998)

The emergence of neuro developmental formulation of Schizophrenia (Weinberger, 1987) and the perspective of developmental psychopathology have focused attention on early developmental processes and the premorbid childhood course of Schizophrenia from birth to onset. The disorder is associated with deficits in cognition, affect and social functioning. Onset of illness rarely occurs before 13years, but then increases steadily during adolescence. Accurate diagnosis and treatment requires familiarity with clinical presentation, phenomenology and course of the disorder.

Adolescent schizophrenia is considered as a more severe variant of adult schizophrenia. Early diagnosis and treatment can prevent devastating consequences. Additionally, the study of early onset variants of the disorder

often enables the examination of a more genetically homogenous and less environmentally influenced disease condition.As such, understanding early onset schizophrenia may possibly provide useful information about etiology and course of adult onset schizophrenia.

While ongoing research continues our understanding of biological and environmental factors associated with and contributing to the disorder, the rarity of the condition has resulted in only modest gains in understanding. Factors associated with early onset schizophrenia such as basic demographics, phenomenology, course and outcome still remain as areas of mystery.

Research in adolescent schizophrenia has needed to address the key questions of 1. continuity and discontinuity with adult schizophrenia.

2. The clinical and aetiological significance of atypically early onset of schizophrenia in adolescence.

In several studies the terms childhood onset, adolescent-onset and early-onset were used interchangeably. In response to lack of precise definitions, Werry(1991) proposed the use of term Early onset (EO) to describe adolescent onset schizophrenia between ages 13 to 17(both included).According to practice parameters issued by American Academy of Child and Adolescent Psychiatry, early onset schizophrenia(EOS)(adolescent schizophrenia) is defined as onset before 18 yrs age, with very early onset (VEOS) developing before 13 years.

REVIEW OF LITERATURE

The issue of whether neuropathology in schizophrenia differs among those with onset in childhood, adolescence,adulthood and late life remains unresolved after a century of debate.

Schizophrenia with onset in adolescence(Early onset schizophrenia) constitute an aetiologically less heterogeneous variant of Schizophrenia.

Most published studies in child and adolescent psychosis use the upper age cut off limit of 18 which also happens to be the lower age limit for most adult studies.

Research studies in Schizophrenia in adolescents is confounded by several methodological limitations. Early studies did not distinguish childhood Schizophrenia from autism and thus are confounded by diagnostic overlap. In studies using the current diagnostic standards, most have focused on childhood onset Schizophrenia, even though onset during adolescence(EOS) is more common.

Other methodological difficulties include use of retrospective study design, lack of standardized assessment such as diagnostic interview, small subject pools and lack of comparison groups(Werry 1992).

Early onset Schizophrenia being a relatively less heterogeneous group, it is useful for examining heterogeneity in Schizophrenia. Probably because of its rarity Schizophrenia has been researched little.(Beitchman 1983, Asarnow 1994)

The early onset schizophrenia with pre schizophrenic developmental problems showed a younger onset of psychosis . This subgroup (EOS) needs further investigation. It might constitute a clearer expression of concept of neuro developmental theory of Schizophrenia and consequently would bring about sharper biological distinctions between EOS and adult onset Schizophrenia.(AOS).

Concept of adolescent schizophrenia

From the 1970's onwards the consensus view is that Schizophrenia in children and adolescents should be defined by unmodified adult criteria. From the ICD 9(WHO 1978) and DSM III (APA 1980) onwards, the same diagnostic criteria have been used for Schizophrenia regardless of the age of onset.

From the historical perspective both Kreplin and Bleuler believed that Schizophrenia presents in similar form, albeit more rarely in childhood and adolescence. Kreplin (1919) found that 3.5% cases of dementia precox began before age of ten, with a further 2.75 arising between ages ten and fifteen. Bleuler (1911) suggested that about 15% cases of Schizophrenia had their onset prior to age fifteen.

From 1930's until 1990's the concept of childhood Schizophrenia broadened to encompass autism and other developmental disorders that were seen as childhood manifestations of adult Schizophrenia.

This lumping together of different disorders under the common rubric of childhood Schizophrenia makes research carried out during this period very difficult to interpret.

Developmental issues in diagnosis

Although the use of same diagnostic criteria aids comparability across age ranges, it does not exclude the possibility that Schizophrenia may present rather differently in childhood and adolescence. Developmental variation in symptoms occurs in other neuropsychiatric disorders like Wilson's and TLE and so it is not unreasonable to consider this possibility in Schizophrenia. The main argument against proposition of 'developmental variant' is the finding that diagnosis of Schizophrenia can be made reliably in children using unmodified adult criteria.

Diagnostic criteria

The diagnosis in children and adolescents is made using the same criteria as in adults.

DSM IV Diagnostic Criteria: Schizophrenia

A. Characteristic Symptoms: At least two of the following are needed, each present for a significant period of time during a 1-month period:

(1) Delusions

(2) Hallucinations

(3) Disorganized speech

(4) Grossly disorganized or catatonic behavior

(5) Negative symptoms (e.g., affective flattening, alogia, avolition)

Note: Only one (A) symptom is needed if (1) the delusions are bizarre or the hallucinations include a voice providing a running commentary on the person's behaviour or thinking, or two or more voices are conversing with each other.

B. Social/Occupational Dysfunction. For a significant portion of the time since onset of the disorder, one or more major areas of functioning such as work, interpersonal relations, or self care markedly deteriorated below the level achieved prior to the onset.

(Or when the onset is in childhood or adolescence, the failure to achieve age-appropriate levels of interpersonal, academic, or occupational achievement)

C) Duration: Continuous signs of the disturbance persist for at least 6 months. This six month period must include at least one month of symptoms that meet criterion A, and may include periods of prodromal or residual symptoms. During the prodromal or residual periods, the signs of the disturbance may be manifested by only negative symptoms or two or more symptoms listed in criterion A present in an attenuated form (e.g., odd beliefs, unusual perceptual experiences)

D) Schizoaffective and Mood Disorder Exclusion. Schizoaffective disorder and mood disorders with psychotic features have been ruled out because either:1) no major depressive or manic episodes have occurred concurrently with active phase symptoms or 2) if mood episodes have occurred during active phase symptoms, their total duration has been brief relative to the duration of the active and residual periods.

E) Substance Abuse/General Medical Condition Exclusion: The disturbance is not owing to the direct effects of a substance (e.g., drugs of abuse, medication) or a general medical condition.

F) If there is history of autistic disorder or other pervasive developmental disorder, then the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations are also present for at least 1 month(or less if successfully treated).

Diagnostic stability

In a follow up study; 110 cases of adolescent onset psychosis presenting as a consecutive series to Maudsley hospital from 1973 to 1991 were assessed.(Hollis 2000). The cases were reassessed 11years after first admission and Positive predictive value for Schizophrenia was 80%. These findings suggest a diagnosis of Schizophrenia using standard diagnostic criteria is likely to be just as stable in adolescence as it is in adult life.

Onset of illness

According to the practice parameters of American Academy of Child and Adolescent psychiatry, adolescent Schizophrenia, otherwise called Early onset Schizophrenia refers to the group with age of onset between 13 to 18 years. If the onset is less than 13 years, they belong to the Very Early Onset Schizophrenia group. Adult onset is defined as patients with onset of illness after 18 years.

According to Schultz et al (2000) the adult onset group is further divided in to early adult onset (18-30years) and intermediate onset (30-40 years). Several studies have attempted to compare Schizophrenia with onset in different age groups.

According to Ropcke et al (2005) the clinical features of early and adult onset Schizophrenia were similar qualitatively and the early onset Schizophrenia seemed to represent a more severe form of the adult onset disorder.

Schultz et al (2000) compared young onset Schizophrenia with the intermediate onset group i.e. onset between 30 and 40 years. They concluded that, compared with young onset subjects intermediate onset patients will have fewer negative and disorganization symptoms.

Mayer et al (1993) compared age of onset of Schizophrenia to psychopathology and found out that patients with early onset disease had more psychosocial impairment at presentation.

Castle et al (1997) compared patients with first manifestation of Schizophrenia after 60 years with onset before the age of 25 years. They found that early onset group compared to their late onset counterparts were more likely to have poor premorbid function and developmental history, more negative symptoms, to have a positive family history of Schizophrenia.

According to Yang et al (1995), who studied the adult manifestations of Schizophrenia with onset before and after 15 years of age, early onset cases scored significantly higher on scales for assessment of negative symptoms. They suggested that when early onset patients grew up, phenomenologically they resembled the Schizophrenia of usual early adult onset in the positive symptom dimension, but with more negative symptoms, which may be fundamental in this age group.

Adolescent Schizophrenia frequently presents with an insidious onset

(Greater than six months) as opposed to acute onset . Non specific behavioural changes including social withdrawal, declining school performance, uncharacteristic odd behaviour which begins on an average, a year before onset of positive psychotic symptoms. In retrospect, it was often apparent that non specific behavioural changes were frequently early negative symptoms, which in turn had their onset well before positive clinical features such as hallucinations and delusions.

Boys have been reported to be more likely to show early signs of abnormal development and have an insidious onset relative to girls with the disorder. (Alaghband- Rad et al 1995, Asarnow et al 1995, Hollis 1995)

The rate of onset of Schizophrenia increases sharply during adolescence with peak ages of onset between 15 – 30 years.(APA 1997).

Distinctions between Early onset schizophrenia and adult onset group can made with respect to gender ratio. Early onset Schizophrenia occurs predominantly in males, with ratios of approximately 2:1.(Green et al 1992; 1986;Kolvin 1971;McClellan & McCurry 1998; Russell et al 1989; Werry et al 1991).

Clinical features of Early onset Schizophrenia

Schizophrenia has been characterized as having two broad sets of symptom clusters, positive and negative. Positive symptoms refer to the more florid hallucinations, delusions and thought disorders. Negative symptoms are those of flat affect, anergy, paucity of speech and thought.(American Psychiatric association 1997).

Recent research has suggested that disorganized behaviour may represent an independent dimension, which include disorganized speech, bizarre behaviour and poor attention. Hallucinations, thought disorder and flat affect have been found in early onset Schizophrenia, while systematized delusions and catatonic clinical features may be less frequent.(Green et al 1992; Russell et al 1989, Werry et al 1991). Specific patterns of presentation

among youth with Schizophrenia are not well studied. Werry et al (1992) indicated that 61 % of their sample reported hallucinations,(of this 57% had auditory hallucinations) and 55 % reported delusions. The authors also noted that delusions tend to be less well formed compared to adults.

Early onset Schizophrenia is characterized by more prominent negative symptoms and disorganization and relatively fewer well systematized delusions and hallucinations when compared with adult Schizophrenia. (Hollis et al 2000, Ballageer et al 2005)It has been hypothesized that compared to young and adolescent onset subjects, intermediate onset (age group 30-40 years) will have fewer negative symptoms.(Schultz et al).

Subtypes

DSM IV mentions five major subtypes for Schizophrenia which are as follows: Paranoid, Disorganized, Catatonic, Undifferentiated and Residual.

Beratis et al(1994) found that disorganized and undifferentiated subtypes were predominantly adolescent onset, whereas the paranoid subtype was most frequently first diagnosed in adult life.

Although all subtypes can occur in adolescence, there is a relative predominance of the disorganized subtype.

Premorbid functioning

Schizophrenia markedly disrupts an individual's psychosocial functioning. Assessment of psychosocial functioning has become an useful

area of investigation but is confounded by the disease process itself. Therefore, considerable research has focused on assessment of individual's psychosocial functioning before the onset of disease process,i.e., the premorbid period.

Schizophrenia is considered to be a neurodevelopmental disorder with early central nervous system lesions affecting normal maturational process. (McCurry 1998; Weinberger 1987).

According to Larsen et el (2004), patterns of premorbid development in schizophrenia suggest both neurodevelopmental and neuro regressive pathways to illness. Knowledge about premorbid development in psychosis can shed light upon theories about etiology and Schizophrenic heterogeneity, and form the basis for early detection initiatives.

Larsen et al (2004) assessed the social and academic dimensions of premorbid functioning in patients with first episode of non affective psychosis. They found that patients with a stable social course compared with a deteriorating one had a shorter duration of untreated psychosis, were older, had more friends and less negative symptoms. Patients with a stable academic course were older at admission. They found that social and academic functioning form fairly independent dimensions of premorbid functioning. Levels of social and academic functioning in childhood may be determined early in life, largely by neurodevelopmental processes related to genetics and perinatal forces. Levels of social and academic functioning that decline later

on, especially in adolescence, may be determined by neuroregressive processes such as developmentally determined reductions in cortical synaptic connectivity. The latter processes have traditionally been labelled as deterioration and have been thought to arise from loss of brain neurons (neurodegeneration).But since post mortem studies have found loss of neuropil but no loss of neurons in the cortex of patients with Schizophrenia, the term neuroregression is preferred for this process. The study clearly illustrates that the heterogeneity of Schizophrenia begins early, long before the onset of psychosis. In their sample of patients, Larsen et al found that as many as 40 % reported ‘ good stable’ social functioning. This is an argument against seeing Schizophrenia as an entirely neurodevelopmental disorder with social dysfunction being an obligatory early manifestation. Second, it seems that having social problems, especially when they worsen over time, is a risk factor for late detection of psychosis. It may be that the social network has adapted to the person having problems and thus does not react when the transition to psychosis is taking place, or it may be that the person’s social network is so small that the likelihood of someone becoming worried is greatly reduced.

Larsen et al(2004) also found that only 57 % of patients were stable at their original childhood level of social functioning. Deterioration describes a relatively high fraction of the sample. This suggests that it is important to assess young adults displaying a marked drop in social functioning as soon as

possible for signs of early psychosis. Schizophrenia is a heterogeneous disorder with neurodevelopmental and neuroregressive pathways to psychosis, processes that may be qualitatively distinct in their neurobiological origins but interactive in their contribution to the pathophysiology of Schizophrenia.

The occurrence of premorbid abnormalities may represent early neuropathological manifestations of the disorder.

Adolescent Schizophrenia has been associated with poor premorbid functioning.(Alaghband-Rad et al 1995; Hollis 1995,Nicholson 2000)

In a study conducted at Maudsley hospital,(Hollis 2000) about one-third cases of adolescent Schizophrenia had significant difficulty in social development affecting the ability to make and keep friends. Similar but less frequent difficulties with premorbid sociability have been noted in representative population samples of adult Schizophrenia. However, premorbid social and behavioural difficulties are not specific to Schizophrenia. Premorbid difficulties also occur in adolescent affective psychosis, at a lower rate than in Schizophrenia, but more frequently than in non psychotic psychiatric controls.

They also found that premorbid developmental impairments show longitudinal continuity with negative symptoms and poor adult outcome. This suggests that premorbid social and developmental impairments may have same underlying neurobiological substrate as negative symptoms.

The negative symptom dimension was specifically associated with premorbid impairment.

Majority of the patients with adolescent Schizophrenia (some reports mention as high as 90%) have premorbid abnormalities.(Eggers 1987; McClellan & McCurry 1998).

Hollis (1995) found that adolescent (Early onset) Schizophrenia had significantly higher rates of premorbid social, motor and language impairments than matched psychiatric controls.

McClellan and McCurry (1998) found that social withdrawal and aberrant peer relationship, are characteristics that equate to negative symptoms.

Studies by Asarnow et al 1994; Nicolson et al 2000,Ballageer et al(2005); have also reported increased risks of premorbid impairment in adolescent onset Schizophrenia.

Premorbid characteristics such as being shy, introvert, withdrawn have been linked with poor prognosis in adolescent Schizophrenia.(Remschmidt 2000).

Associated features

A) Family history of Schizophrenia

The increased clinical severity of adolescent Schizophrenia is associated with a greater familial risk than the adult onset form of the

disorder. Increased family history of Schizophrenia has been found in relatives of patients with adolescent Schizophrenia.(Eggers 1978; Green et al 1992; Kolvin 1971 ; McClellan 1993; Werry 1991).

Early onset of schizophrenia seems associated with high genetic loading for the disorder. Research has borne out this relation, noting an increased risk of schizophrenia among the relatives of children with schizophrenia (Asarnow et al 2001).

Asarnow and colleagues (2001) reported that the relatives of youth with schizophrenia in their study were 17 times more likely to have a schizophrenia spectrum disorder in relation to controls. This risk is obviously far greater than the risk in the general population, as well as greater than that found in similar studies of relatives of adults with schizophrenia (three to six times more likely among relatives of adults with schizophrenia).

Findings from this report suggest an increased genetic component to early onset schizophrenia over and above that found in adult schizophrenia. In a similar report, Nicolson and colleagues (2003) advanced this line of study by including relatives of patients with adult onset schizophrenia as a control group.

Findings confirmed speculations made by Asarnow et al. (2001) that youth with schizophrenia are more likely to have relatives with a schizophrenia spectrum disorder in relation to adults with typical age of onset

schizophrenia. Collectively, these findings support the strong role of genetic contributions to early onset schizophrenia.

A positive family history of Schizophrenia among first degree relatives was found in 20 % of adolescent probands with Schizophrenia. This is about double the rate reported in comparable studies in adult Schizophrenia. Interestingly it has been found that , it is the presence of negative symptoms in the proband that predicts family history of Schizophrenia. This suggests that negative symptoms may represent the genetically transmitted phenotype in Schizophrenia.(Hollis 2000).

However most studies are plagued with limitations due to lack of standardized instruments in assessment and diagnosis in relatives.

B) Socio economic status

It is not possible to say whether there is any relation to socioeconomic status. The available studies have a selection bias towards in patient samples, with higher rates of lower socioeconomic status in some studies,(Green et al 1992; Kolvin 1971) but not in others.(Russell et al 1989; Werry 1991).

C) Gender Ratio

Although male predominance is the consistent finding in incident samples of early adult onset Schizophrenia; the picture is far less clear in adolescent Schizophrenia, with some studies reporting a male predominance and others finding no gender difference.(Jacobsen & Rapoport 1998).

According to some studies (Green et al 1992; Kolvin 1971;McClellan & McCurry 1998; Russell et al 1989; Werry et al 1991)Adolescent Schizophrenia occurs predominantly in males, with ratios of approximately

2:1.Previous research suggests a male-to-female ratio ranging from 2:1 to 5:1(Hollis, 1995; Green et al., 1992; Werry, 1992; Beitchman, 1985;). This range of gender ratios conflicts with general prevalence estimates of adult schizophrenia that suggest approximately equal gender distribution, but is consistent with the notion that males typically have an earlier age of onset than females. Kolvin and colleagues (1971) suggested that the predominance of males among youth with schizophrenia is a distinguishing characteristic of early onset schizophrenia.

It is possible that the differences between the studies may be the result of referral bias and at present good population based epidemiological studies of adolescent Schizophrenia are lacking.

D) Duration of untreated psychosis (DUP)

Duration of untreated psychosis is defined as time from the onset of first psychotic symptom till initiation of first treatment.

According to Hollis (1995) ;Duration of untreated psychosis is a predictor of poor outcome in adolescent Schizophrenia. Ballageer et al (2005) suggested that the adolescent group experienced longer duration of untreated psychosis compared to adult onset group.

AIMS AND OBJECTIVES

Following are the aims and objectives of the study:

1. To evaluate the differences in clinical features between adolescent(EOS) schizophrenia and the adult onset group.

2. To compare the premorbid adjustment of the two groups.

3. To assess the differences between the two groups with respect to the following variables:

   a) Type of onset b) gender distribution c)Family history of schizophrenia in first degree relatives d)DUP- Duration of untreated psychosis.

4. To correlate family history with clinical symptom dimensions and severity of illness at presentation.

HYPOTHESIS

1. Patients with early onset Schizophrenia do not differ from adult onset group in type of illness onset.
2. There is no difference in duration of untreated psychosis between the early onset and the adult onset groups.
3. There is no difference in severity of illness between early onset and Adult onset Schizophrenia.
4. There is no difference between the early onset and adult onset group with respect to subtype of Schizophrenia.
5. There is no difference between the two groups based on negative symptoms.
6. There is no difference between the two groups based on disorganization symptoms..
7. Early onset Schizophrenia patients do not differ from adult onset group in the degree of premorbid impairment.
8. Poor premorbid function is not related to the presence of negative symptoms.
9. The early onset Schizophrenia group do not differ from adult onset group with respect to family history of Schizophrenia in first degree relatives.

MATERIALS AND METHODS

Study design- cross sectional study

Inclusion criteria:

a) Cases : Early onset Schizophrenia (adolescent Schizophrenia)

1. Patients satisfying the DSM IV criteria for Schizophrenia .
2. Age group 13-18 years (adolescent) were included in the study. The age of onset of illness also between 13-18 years.
3. 30 consecutive patients attending the Adolescent clinic, Institute Of Mental Health, Chennai who fulfilled the inclusion criteria were chosen.. All the cases selected for the study were drug naive and experiencing first episode of psychosis.

b) Controls (Adult onset Schizophrenia)

2. Patients satisfying the DSM IV criteria for Schizophrenia.
3. Age group 30-40 years. Age of onset of illness also between 30 – 40 years.
4. 30 consecutive patients attending the new case out patient department of Institute of Mental Health, Chennai were chosen based on inclusion criteria.
5. All patients were drug naïve and experiencing first episode of psychosis.

Exclusion criteria:

1. Presence of co morbid substance abuse.
2. comorbid psychiatric illness.
3. Associated medical or neurological illness.

Instruments used:

1. Proforma for sociodemographic data, illness details.
2. Brief psychiatric rating scale (BPRS).
3. Scale for assessment of positive symptoms (SAPS).
4. Scale for assessment of negative symptoms (SANS).
5. Premorbid adjustment scale (Cannon- Spoor et al, 1982).
6. Global assessment of functioning scale (GAF).
7. Family history research diagnostic criteria.

Brief Psychiatric Rating Scale (BPRS)

The brief Psychiatric Rating Scale was developed in late 1960's and covers a broad range of areas including thought disturbance, emotional withdrawal and retardation, anxiety and depression, hostility and suspiciousness. It has 18 items, rated on a seven point, item specific Likert scale from 0-6, with the total score ranging from 0 – 108.Validity of the scale is good as measured by correlations with other measures of symptom severity, especially those assessing Schizophrenia symptomatology.

Scale for the Assessment of Positive Symptoms (SAPS)

The scale was developed by Nancy C Andreasen and is designed to provide a detailed assessment of positive symptoms of Schizophrenia. The domains include hallucinations, delusions, bizarre behaviour, and thought disorder and inappropriate affect. The scale has 35 items, each item scored from 0-5.

Psychotic symptom score represented the sum of SAPS global ratings of hallucinations and delusions. Disorganization score represented the sum of SAPS global ratings of bizarre behaviour, positive formal thought disorder and inappropriate affect.

Scale for the Assessment of Negative Symptoms (SANS)

The scale was developed by Nancy C Andreasen and helps to characterize the negative symptoms of Schizophrenia. The domains include affective flattening, alogia, avolition- apathy, anhedonia- asocialty and attention.. The scale has 24 items, each item scored from 0-5. Negative symptom score represented the sum of SANS global scores of alogia, avolition, affective flattening and anhedonia.

Premorbid Adjustment Scale(PAS) Cannon- Spoor et al (1982)

Premorbid Adjustment Scale is a rating scale which was designed to evaluate the degree of achievement of developmental goals at each of several periods of a subject's life before onset of Schizophrenia. The scale assesses the level of functioning in four major areas at each of several periods of a

subject's life : isolation, peer relationships, ability to function outside family, and capacity to form intimate socio-sexual ties. Items evaluating age appropriate functioning in these areas are repeated for each period of a subject's life. The four life periods are as follows: Childhood up to 11years, Early Adolescence 12-15 years, Late adolescence 16-18 years, Adulthood 19 years and beyond, and a final section labelled as general.

The scale is intended to measure only Premorbid function : with Premorbid period being defined as the period ending six months before evidence of characteristic florid psychotic symptomatology including delusions, hallucinations, thought disorder, inappropriate or bizarre behaviour, or gross psychomotor behaviour. Only those life periods that are premorbid by this definition should be rated on the scale regardless of the present age of the subject. Ratings are based on histories derived from subject's hospital records or family members.

Rating : Each section contains number of items with scoring ranging from 0-6, 0 denoting hypothetically the healthiest and 6 the least healthy end.

Scoring .The rating received for each item in a section are summed and expressed as total score divided by possible score. (subscale score)

The possible score indicates the highest score obtainable by adding the maximum score for all items completed. When no information is available on a particular item, that item is not scored.

An over all score for the whole scale might be calculated by averaging subscale score for the subscales rated for the patient. An average is preferred to a total score in order to avoid bias that would occur in cases in which sum of a few highly scored subscales would result in the same score as the sum of several moderately or low scored subscales ,when age of onset of illness or lack of information leads to some subscales being left out.

Global Assessment of Functioning Scale (GAF)

The Global assessment of Functioning Scale was developed in the early 1990's to rate Axis V of DSM IV and provides a measure of overall functioning related to psychiatric symptoms. The scale is rated on a 100 point scale based on all available information, with clear descriptions of each ten point interval.

The scores are grouped in to three categories: a) Good: score 100 - 71

b) Moderate: score 70 - 41 c) Poor : score 40-0 .

Family History Research Diagnostic Criteria

The Family History Research Diagnostic Criteria was put forth by Andreasen et al in 1977. It was used to make diagnosis according to DSM criteria on all first degree relatives of patients. The instrument provides the criteria for twelve diagnoses.

METHODOLOGY

Thirty patients satisfying the DSM IV criteria for Schizophrenia in the age group 13-18 years (Early onset Schizophrenia group) were evaluated. The cases were chosen from consecutive patients attending the Adolescent Clinic and controls from the out patient department of Institute of Mental Health, Chennai. The Period of the study was between November 2005 and August 2006. The sociodemographic data, clinical features and premorbid function was compared to a control group which consisted of patients with Schizophrenia in the age group 30- 40 years(Adult onset Schizophrenia).Both cases and controls were experiencing their first episode of psychosis and were drug naïve.

The thesis and its methodology were discussed and approved by the ethics committee of the research panel of Institute of Mental Health, Chennai.Informed consent was obtained from all patients and guardians in case of adolescents. The patients and informants were interviewed clinically and rating scales applied. Information regarding Premorbid function and Family history of Schizophrenia was sought from relatives.

The data thus collected was tabulated and discussed. Statistical analysis of the data was carried out using chi square test for categorical variables and Student-t test for continuous variables. Pearson correlation test was used to find association between variables studied.

RESULTS

TABLE 1 : DISTRIBUTION BASED ON AGE OF ONSET

	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
age of onset	16.20	.64	33.15	2.53	t=35.6 P=0.001 (s)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The mean age of onset in Early onset group was 16.20, SD(0.64).

The mean age of onset in Adult onset group was 33.15, SD(2.53).

TABLE 2 : DISTRIBUTION BASED ON GENDER

		group		Total
		EOS	AOS	
Sex	Male	16	18	34
	Female	14	12	26
Total		30	30	60

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

$\chi 2 = 0.27$ P=0.60 (NS)

In the Early onset Schizophrenia group 53.3% (n = 16) were males and 46.6 % (n = 14) were females.

In the adult onset Schizophrenia group 60 % were males (n=18) and 40 % (n = 12) were females.

The gender ratio was found to be 1.14:1 in the Early onset group and 1.5:1 in the adult onset group.

Males have a predominant representation in both early onset and adult onset Schizophrenia.

There was no statistically significant gender difference between the two groups.

TABLE 3 :COMPARISON BASED ON EDUCATIONAL STATUS

	group				**Student t-test**
	EOS		**AOS**		
	Mean	**SD**	**Mean**	**SD**	
Education (in yrs)	7.43	1.59	7.87	2.54	t=0.79 P=0.43 (NS)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

There was no statistically significant difference in educational status between the two groups.

TABLE 4 : COMPARISON BASED ON DURATION OF UNTREATED PSYCHOSIS (DUP)

	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
DUP(months)	9.93	4.61	8.67	2.58	t=1.31 P=0.90 (NS)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The mean duration of untreated psychosis (months) in early onset group was 9.93(SD= 4.61) and in the adult onset group it was 8.67 (SD = 2.58).

Duration of untreated psychosis was longer in the early onset group compared to adult onset group .No statistically significant difference was observed in our study.

TABLE 5 : DISTRIBUTION BASED ON TYPE OF ONSET OF ILLNESS

Onset of illness		Group		Total
		EOS	AOS	
Type of onset	Insidious	28	21	49
	Acute	2	9	11
Total		30	30	60

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

$\chi 2 = 5.45$ P=0.02 (S)

In the early onset group 93.3 % (n= 28) had an insidious type of illness onset and 6.6 %.(n= 2) had acute onset.

In the adult onset group 70 % (n= 21) had insidious onset and 30 % (n= 9) had acute onset of illness.

The early onset Schizophrenia patients had predominantly insidious type of illness onset and the results were statistically significant with P Value of 0.02.

TABLE 6:DISTRIBUTION BASED ON SUBTYPE OF SCHIZOPHRENIA

	group		
SUBTYPE	EOS	AOS	Total
Catatonic	0	1	1
Disorganized	15	0	15
Paranoid	4	16	20
Undifferentiated	11	13	24
Total	30	30	60

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

$\chi 2$ =23.67 P=0.001 (S)

In the Early onset group 50 %(n = 15) had Disorganized Schizophrenia, 36.6 %(n= 11) had Undifferentiated subtype and 13.3 % (n= 4) had paranoid subtype. None of the subjects were diagnosed to have catatonic Schizophrenia.

In the adult onset group 53.3 % (n=16) had paranoid Schizophrenia, 43.3 % (n=13) had Undifferentiated subtype and 3.3% (n=1) had catatonic Schizophrenia.

The subtype of Schizophrenia predominant among the Early onset group was Disorganized type and in the Adult onset group it was Paranoid Schizophrenia. The results were statistically significant. (P= 0.001).

TABLE 7: COMPARISON BASED ON BPRS SCORE

BPRS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
Mean BPRS	21.40	6.46	15.60	3.50	t=4.32 P=0.001 (S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The Mean BPRS Score in the early onset group was 21.40(SD = 6.46) and in the Adult onset group was 15.60 (SD = 3.50). The difference between the groups was significant(P= 0.001).

TABLE 8 : COMPARISON BASED ON SAPS SCORES

SAPS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
Mean SAPS	27.70	12.70	25.40	12.23	t=0.71 P=0.48 (NS)

Mean SAPS Scores in the early onset group was 27.70 (SD = 12.70) where as in the adult onset group it was 25.40 (SD = 12.23). Although the mean score was higher in the early onset the difference was not found to be statistically significant (P = 0.48)

TABLE 9 : COMPARISON BASED ON PSYCHOTIC SYMPTOM SCORE

SAPS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
SAPS Psychotic symptom score	2.93	2.38	4.53	2.66	t=2.46 P=0.02 (S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The Psychotic symptom score was calculated as sum of SAPS global ratings of hallucinations and delusions.

The mean score in the early onset group was found to be 2.93 (SD =2.38) and in the adult onset group it was 4.53 (SD = 2.66).

Thus the mean psychotic symptom score was higher in the adult onset group and the difference found to be statistically significant (P = 0.02)

TABLE 10 :COMPARISON BASED ON DISORGANIZATION SCORE

SAPS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
SAPS Disorganization score	6.10	3.52	3.30	1.12	t=4.16 P=0.001(S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The disorganization score was calculated as the sum of SAPS global ratings of disorganized/bizarre behaviour, positive formal thought disorder and inappropriate affect.

The mean score was 6.10 (3.52) in the early onset group and 3.30 (SD=1.12) in the adult onset group. Disorganization score was found to be higher in the early onset group and the result was statistically significant. (P= 0.001)

TABLE 11 : COMPARISON BASED ON SANS SCORE

SANS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
Mean SANS Score	46.27	18.10	30.73	15.82	t=3.54 P=0.001 (S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The Mean SANS score in early onset Schizophrenia group was 46.27(SD = 18.10) and in the adult onset group it was 30.73(SD = 15.82).

The score was significantly higher in the early onset group and the results were statistically significant at P = 0.001.

TABLE 12 : COMPARISON BASED ON NEGATIVE SYMPTOM SCORE

SANS	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
Mean Negative symptom score	8.47	4.26	5.57	2.62	t=3.18 P=0.002 (S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The Negative symptom score was calculated as the sum of SANS global ratings of alogia, avolition, anhedonia and affective flattening.

In the early onset group the mean negative symptom score was 8.47

(SD = 4.26) and it was 5.57 (SD = 2.26) in the adult onset group.

The score was higher in early onset group and the results were statistically significant .(P = 0.002). (Figure 5)

TABLE 13 : COMPARISON BASED ON FAMILY HISTORY OF SCHIZOPHRENIA

Family History		**group**		**Total**
		EOS	**AOS**	
FHRDC	negative	21	27	48
	positive	9	3	12
Total		30	30	60

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

$\chi 2 = 3.84$ P=0.05 (S)

The family history was assessed by applying Family history research diagnostic criteria (FHRDC) to first degree relatives of patients with Schizophrenia.

In the early onset group 30 % (n= 9) had positive family history of Schizophrenia and in the adult onset group it was 10 % (n= 3).

Applying Chi Square test the difference was found to be statistically significant (P= 0.05).

The positive family history of Schizophrenia in early onset group was three times the rate found in adult onset group.

TABLE 14 : COMPARISON BASED ON GAF SCORES

		Group		Total
		EOS	**AOS**	
GAF	Poor	23	16	39
	Moderate	7	14	21
Total		30	30	60

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

$\chi 2 = 3.84$ P=0.05 (S)

The patients were grouped based on the GAF Scores in to three categories.

100 - 71 = good, 70- 41= moderate and 40 - 0 = poor.

None of the patients in both the groups had scores in range of 100-71.

Moderate GAF score was found in 23.3 % (n=7) in the early onset group and 46.6% (n=14)in the adult onset group.

Poor GAF score was seen in 76.6 %(n=23)of the early onset group and 53.3% (n=16) of the adult onset group.

The differences between the two groups was statistically significant with a P value of 0.05.

TABLE 15 : ASSOCIATION BETWEEN GAF SCORE AND NEGATIVE SYMPTOM SCORE

Group			Negative symptom score SANS
EOS	GAF	Pearson Correlation	-.365(*)
		Sig. (2-tailed)	.048
		N	30
AOS	GAF	Pearson Correlation	-.226*
		Sig. (2-tailed)	.050
		N	30

Correlation is significant at the 0.05 level (2-tailed).

Association between GAF Score and SANS Negative symptom score was calculated using Pearson Correlation. The Correlation was found to be statistically significant .

Hence it is evident that patients with the higher negative symptom scores had poorer GAF Scores.

TABLE 16 : COMPARISON BASED ON PREMORBID ADJUSTMENT SCALE (PAS) SCORES

PAS SCORE	group				Student t-test
	EOS		AOS		
	Mean	SD	Mean	SD	
Average PAS score	.57	.08	.32	.08	t=12.42 P<0.001 (S)

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

The average PAS Score was calculated from the subscale scores relevant for each age group.

The average PAS score was 0.57(SD = 0.08) in the early onset group and 0.32(SD=0.08) in the adult onset group.

The rating in PAS is such that in each item zero denotes hypothetically the healthiest and six denotes the least healthy end. So higher scores on PAS is suggestive of poorer premorbid function.

The Average PAS Score was higher in the Early onset group compared to adult onset group and the difference was statistically significant. (P Value<0. 001).

TABLE 17 : ASSOCIATION BETWEEN PAS SCORE AND NEGATIVE SYMPTOM SCORE

Group			**Average PAS Score**
EOS	Negative Symptom Score SANS	Pearson Correlation	.415(*)
		Sig. (2-tailed)	.023
		N	30
AOS	Negative Symptom Score SANS	Pearson Correlation	.305
		Sig. (2-tailed)	.102
		N	30

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)

AOS - Adult onset Schizophrenia.

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Association between Average PAS Score and Negative symptom score was calculated using Pearson correlation .

In the Early onset group a significant association was found . It was found that patients with higher negative symptom scores had poorer premorbid function.

TABLE 18: ASSOCIATION BETWEEN SEVERITY OF ILLNESS, NEGATIVE SYMPTOMS AND PREMORBID FUNCTION

Group	Score	Correlation	Mean BPRS	Mean Negative Symptom Score	Average PAS Score
EOS	Mean BPRS	Pearson Correlation	1	.069	.191
		Sig. (2-tailed)	.	.715	.313
		N	30	30	30
	Mean Negative Symptom Score	Pearson Correlation	.069	1	.415(*)
		Sig. (2-tailed)	.715	.	.023
		N	30	30	30
	Average PAS Score	Pearson Correlation	.191	.415(*)	1
		Sig. (2-tailed)	.313	.023	.
		N	30	30	30
AOS	Mean BPRS	Pearson Correlation	1	.320	.236
		Sig. (2-tailed)	.	.085	.209
		N	30	30	30
	Mean Negative Symptom Score	Pearson Correlation	.320	1	.305
		Sig. (2-tailed)	.085	.	.102
		N	30	30	30
	Average PAS Score	Pearson Correlation	.236	.305	1
		Sig. (2-tailed)	.209	.102	.
		N	30	30	30

* Correlation is significant at the 0.05 level (2-tailed).

A significant correlation was found between Mean negative symptom score and average PAS scores, but both scores did not correlate with Mean BPRS score which represents severity of illness.

TABLE 19 : COMPARISON OF NEGATIVE SYMPTOMS AND SEVERITY OF ILLNESS BASED ON FAMILY HISTORY

Group		Family History	N	Mean	Std. Deviation	Student t-test
EOS	Mean Negative Symptom Score	Positive	9	12.89	3.408	t=5.10 P=0.001
		Negative	21	6.57	3.010	
	Mean BPRS Score	Positive	9	22.94	4.21	t=2.01 P=0.01
		negative	21	18.24	3.46	
AOS	Mean Negative Symptom Score	Positive	3	8.67	1.528	t=0.71 P=0.48
		Negative	27	6.22	2.501	
	Mean BPRS Score	Positive	3	15.00	2.646	t=0.308 P=0.760
		negative	27	15.67	3.616	

EOS - Early onset Schizophrenia (Adolescent Schizophrenia)
AOS - Adult onset Schizophrenia.

In the Early onset group there was significantly higher mean negative symptom score if the family history of Schizophrenia was positive.(P=0.001).

Mean BPRS Score which represents the severity of illness also was significantly higher in the presence of positive family history.(P=0.01)

In the Adult onset group the above scores were not Significantly higher if the family history of Schizophrenia was positive.

DISCUSSION

The mean age of onset in Early onset Schizophrenia (Adolescent) group was 16.20, SD (0.64).This is comparable with most of the previous studies by Kolvin (1971) and Volkmar et al(1988).(Table 1,Figure 1).

Regarding gender differences males have a predominant representation in both early onset and adult onset Schizophrenia. There was no statistically significant gender difference between the two groups.(Table 2)The results of the study are on par with study by Jacobsen and Rapoport (1998) which found no gender difference. Our study brought out a gender ratio of 1.14:1 in the early onset group and 1.5:1 in the adult onset group. However studies by Kolvin (1971) and Werry et al(1991) have reported gender ratios of approximately 2:1.

Our study found no significant difference between the adult and early onset Schizophrenia with respect to educational status.(table 3)

Duration of untreated psychosis in months(DUP) (Table 4) was longer in the early onset group 9.93(SD= 4.61) compared to adult onset group 8.67 (SD = 2.58) which is consistent with other studies by Hollis(2000) & Ballageer et al(2005).

However, no statistically significant difference was observed in our study.

This being a hospital based study, a berksonian bias is present in assessing DUP and hence the results are not comparable to community studies. The actual duration of untreated psychosis is much longer in the community samples and is the target of Early Psychosis Prevention and Intervention Programmes which aim at early detection and initiation of treatment to improve outcome.

The early onset Schizophrenia patients had predominantly insidious type of illness onset (93.3%) compared to adult onset group(70%) and the results were statistically significant with P Value of 0.02.(Table 5)(figure2)

The findings are on par with studies by Hollis(1995,2000), Asarnow et al(1994) & Alaghband- Rad et al(1995). Insidious onset has been found to be a prognostic predictor for poor outcome in the early onset (adolescent) group according to Hollis(2000).

The subtype of Schizophrenia predominant among the Early onset group was Disorganized type and in the Adult onset group it was Paranoid Schizophrenia. The results were statistically significant. (P= 0.001).(Table 6,Figure 3)The findings are similar to studies by Beratis et al (1994) Hollis (1995) and the Practice guidelines put forth by American Academy Of Child and Adolescent Psychiatry.

The mean BPRS score in the early onset group was higher and the difference was statistically significant(P<0.001).The results are similar to studies by Yang et al(1995), Hafner et al(1995).

The mean SAPS score was higher in early onset Schizophrenia group but the difference was not found to be statistically significant (P = 0.48) (table 8)

The results are similar to those reported by previous studies by Werry et al(1991) Schultz et al(2000) and Ballageer et al (2005).

The Psychotic symptom score was calculated as sum of SAPS global ratings of hallucinations and delusions.

The mean score in the early onset group was found to be 2.93 (SD=2.38) and in the adult onset group it was 4.53(SD = 2.66). (Table 9; figure 4)

Thus the mean psychotic symptom score was higher in the adult onset group and the difference found to be statistically significant (P = 0.02).

This finding is similar to studies by Schultz et al(2000), McClellan et al(2000) who reported that Early onset Schizophrenia (adolescent Schizophrenia) patients have fewer positive symptoms compared to adult onset group.

The disorganization score was calculated as the sum of SAPS global ratings of disorganized /bizarre behaviour, positive formal thought disorder and inappropriate affect.The mean score was 6.10 (SD= 3.52) in the early onset group and 3.30 (SD=1.12) in the adult onset group. Disorganization score was found to be higher in the early onset group and the results were statistically significant. (P= 0.001)(Table 10;figure 4)

This finding is in keeping with studies by Hollis(2000), Schultz et al(2000), Beratis et al(1994), Ballageer et al(2005), McClellan et al(2000) and Nicolson et al(1999). According to Hollis(2000) Disorganization is a predictor of poor outcome in adolescent Schizophrenia.

The Mean SANS score was significantly higher in the early onset group and the results were statistically significant at P = 0.001.(Table 11)

The results are thus similar to studies by Hollis(2000), Ballageer et al(2005), Schultz et al(2000),Werry et al(1991), Russell et al(1989) and Green et al(1992)

The presence of greater negative symptoms at onset has been found to be a predictor of poor outcome in the early onset group. This would have implications in choosing the class of antipsychotics . Predominance of negative symptoms leads to a delay in seeking health care and a consequent progression of the disease process before treatment can be initiated.

In the early onset group the mean negative symptom score was 46.27(SD = 18.10) and it was 30.73 (SD = 15.82) in the adult onset group.

The score was higher in early onset group and the results were statistically significant .(P = 0.001).(Table 12)(figure 5) These findings are consistent with studies by Schultz et al(2000) who have reported that negative symptom score is higher in early onset (adolescent) Schizophrenia.

The family history was assessed by applying Family history research diagnostic criteria (FHRDC) to first degree relatives of patients with Schizophrenia.

In the early onset group 30 % (n= 9) had positive family history of Schizophrenia and in the adult onset group it was 10 % (n= 3).Applying Chi Square test the difference was found to be statistically significant(P= 0.05).(Table 13)

The positive family history of Schizophrenia in early onset group was three times the rate found in adult onset group.

The results are consistent with studies by Eggers(1978) , Green et al(1992), Kolvin(1971) , McClellan et al (1993)and Werry et al (1991) which reported that increased family history of Schizophrenia has been found in relatives of adolescents with Schizophrenia.

On assessing the Global functioning, Moderate GAF score was found in 23.3 % (n=7) in the early onset group and 46.6% (n=14)in the adult onset group.

Poor GAF score was seen in 76.6 %(n=23)of the early onset group and 53.3% (n=16) of the adult onset group. The differences between the two groups was statistically significant with a P value of 0.05.(Table 14)

The results are comparable to study by Rabinowitz et al(2005) who found that GAF scores were poor in adolescent group before hospitalization and it would be a predictor of length of hospital stay and future outcome.

Association between GAF Score and SANS Negative symptom score was calculated using Pearson Correlation. The Correlation was found to be statistically significant in the both groups. (Table 15)

Hence it is evident that patients with the higher negative symptom scores had poorer GAF Scores in both adult and early onset group.

The average PAS (Premorbid adjustment scale) score was 0.57(SD = 0.08) in the early onset group and 0.32(SD=0.08) in the adult onset group. The rating in PAS is such that in each item zero denotes hypothetically the healthiest and six denotes the least healthy end. So higher scores on PAS is suggestive of poorer premorbid function. The Average PAS Score was higher

in the Early onset group compared to adult onset group and the difference was statistically significant.(P Value < 0.001).(table 16)

The results are on par with studies by Hollis (1995),Alaghband-Rad et al(1995),Nicholson et al(1999), who reported higher rates of premorbid impairment in Early onset (Adolescent) Schizophrenia compared to the adult onset group. Other studies which have similar conclusions include those by Eggers et al(1978),Asarnow et al(1994),McClellan & McCurry et al(1998).According to Remschmidt et al (2002) degree of premorbid impairment is linked to poor prognosis in Adolescent Schizophrenia.

Association between Average PAS Score and Negative symptom score was calculated using Pearson correlation. (Table 17)In the Early onset group a significant association was found. It was found that patients with higher negative symptom scores had poorer premorbid function. This correlation was not significant in adult onset group.The results are on par with study by Hollis (1995).

A significant correlation was found between Mean negative symptom score and average PAS scores, but both scores did not correlate with Mean BPRS score which represents severity of illness.(Table 18)This is consistent with studies by Hollis(1995).

In the Early onset group there was significantly higher mean negative symptom score if the family history of Schizophrenia was positive (P=0.001).Mean BPRS Score which represents the severity of illness also was significantly higher in the presence of positive family history.(P=0.01)(Table 19;Figure 6)

In the Adult onset group the above scores were not significantly higher if the family history of Schizophrenia was positive.

Interestingly it has been found that, it is the presence of negative symptoms in the proband that predicts family history of Schizophrenia. (Hollis 2000) This suggests that negative symptoms may represent the genetically transmitted phenotype in Schizophrenia. The study highlights the importance of assessing negative symptoms at onset of illness.

However most studies are plagued with limitations due to lack of Standardized instruments in assessment and diagnosis in relatives. Our study used Family history Research diagnostic criteria in an attempt to overcome this limitation.

SUMMARY

Thirty patients with Adolescent Schizophrenia (Early onset group; age 13-18 years) drug naïve, first episode were compared with thirty patients with adult onset schizophrenia (30-40 years) based on socio demographic profile, illness onset, subtype of schizophrenia, clinical features, family history and premorbid function.

We found that there were no significant differences between the groups with respect to education and duration of untreated psychosis. Most of the patients with Early onset (adolescent) Schizophrenia had insidious onset compared to adult onset group.

Disorganized Schizophrenia was the predominant subtype in adolescents compared to paranoid in adults. The severity of illness was more in Early onset (adolescent) Schizophrenia. The Early onset group had higher disorganization and negative symptom scores.

Early onset Schizophrenia group had positive family history (30 %)in first degree relatives; rate three times that in adult onset group(10%).The global function scores and premorbid adjustment scores of adolescent onset group was poorer .The premorbid adjustment was poorer in the presence of negative symptoms only in the early onset group.

The group of Early onset Schizophrenia with positive family history had greater negative symptoms at presentation. In Early onset Schizophrenia positive family history of Schizophrenia is associated with greater negative symptoms and greater illness severity at onset.

CONCLUSIONS

- Most of the patients with Early onset (adolescent) Schizophrenia had insidious onset compared to adult onset group.
- Disorganized Schizophrenia was the predominant subtype in adolescents compared to paranoid in adults.
- The severity of illness was more in Early onset (adolescent) Schizophrenia.
- The Early onset group had higher disorganization and negative symptom scores.
- Early onset Schizophrenia group had positive family history (30%)in first degree relatives; rate three times that in adult onset group(10%).
- The global function scores and premorbid adjustment scores of adolescent onset group was poorer .
- The premorbid adjustment was poorer in the presence of negative symptoms only in the early onset group.
- The group of Early onset Schizophrenia with positive family history had greater negative symptoms at presentation.

- In Early onset Schizophrenia positive family history of Schizophrenia is associated with presence of greater negative symptoms and greater illness severity at onset.

The study highlights the importance of factors like negative symptoms, disorganization, positive family history of Schizophrenia and poor premorbid function all of which have been put forth in previous studies as predictors of poor outcome in Early onset(adolescent) Schizophrenia.

LIMITATIONS AND FUTURE DIRECTIONS

1. Small sample size
2. This is a hospital based study- a community study would give the correct representation of variables like duration of untreated psychosis(DUP).
3. Since the sample consisted of patients referred to a tertiary service, our patients could be more severely ill and therefore it might not be possible to generalize the results to community samples.
4. The role of prognostic predictors has to be validated through prospective studies.

REFERENCES

1. Alaghband-Rad J, McKenna K,Gordon CT.(1995) Childhood onset Schizophrenia: The severity of premorbid course.Journal Of The American Academy Of Child And Adolescent Psychiatry,34(10):1273-1283.

2. Albus M, Scherer J, Heuber S.(1994)The impact of familial loading on gender differences in age at onset of Schizophrenia.Acta Psychiatrica Scandinavica, 82(20:132-4.

3. Alda M, Abrens B,Lit W.(1996) Age of onset in familial and sporadic Schizophrenia.Acta Psychiatrica Scandinavica,93(6):447-50.

4. American Psychiatric Association (1994) : Diagnostic and Statistical Manual of mental disorders, 4th edition. Washington DC,American Psychiatric Association.

5. Andreasen N C.(1989) Scale for assessment of negative symptoms.British Journal of Psychiatry,155 Supplement 7:53-58.

6. Andreasen N C.(1982) Negative symptoms in Schizophrenia-Definition and reliability. Archives Of General Psychiatry,39(7):784-788.

7. Andreasen N C, Endicott J, Spitzer R L,Winoker G.(1977) The family history method using diagnostic criteria.Archives Of General Psychiatry,34:1229-1235.

8. Armenteros J L, Fennelly B W,Hallin A,et al.(1995b) Schizophrenia in hospitalized adolescents:clinical diagnosis,DSM III R, DSM IV and ICD-10 criteria.Psychopharmacology Bulletin,31(2):383-387.

9. Asarnow R F,Tomson M C,Goldstein M J.(1994) Childhood onset Schizophrenia : A follow up study.Schizophrenia Bulletin,20:599-617.

10. Asarnow J R, Goldstein M J.(1986) Schizophrenia during adolescence and early adulthood: A developmental perspective on risk research. Clinical Psychology Review,6(3):211-235.

11. Ballageer T, Malla A, Manchanda. R(2005) Is adolescent onset first episode psychosis different from adult onset? Journal of American academy of child And adolescent psychiatry , 44(8):782-789.

12. Beitchman JH. (1985) Childhood Schizophrenia- A review and comparison with adult onset Schizophrenia. Psychiatric Clinics Of North America, 8 (4) : 793-840.

13. Beratis S,Gabriel J,Hoidas S.(1994) Age at onset of subtypes of Schizophrenic disorders. Schizophrenia Bulletin,20:287-296.

14. Biswas P, Malhotra S,Malhotra A,Gupta N.(2006) Comparative study of neuropsychological correlates in Schizophrenia with onset in childhood, adolescence, adulthood.European Journal Of Child And Adolescent Psychiatry,15(6):360-366.

15. Byrne M, Agerbo E, Mortensen P B.(2002) family history of psychiatric disorders and age at first contact in Schizophrenia : An Epidemiological study. British Journal of Psychiatry,181:19-25.

16. Campbell M, Armenteros J L, Spencer E K, Kowalik S C, Erlenmeyer-Kimling L.Schizophrenia and psychotic disorders.Ed Jerry M Wiener,Textbook of Child and Adolescent Psychiatry,2nd edition.

17. Cannon-Spoor E H, Potkin S G, Wyatt R J. (1982).Measurement of premorbid adjustment in chronic Schizophrenia. Schizophrenia Bulletin,8(3):470-484.

18. Castle D T, Wessley S, Howard R, Murray R M.(1997) Schizophrenia with onset at extremes of adult life. International Journal Of Geriatric Psychiatry, 12(7): 712-17.

19. Corcoran C, Whitaker A, Coleman E,.et al.(2005) Olfactory defecits, cognition and negative symptoms in early onset psychosis. Schizophrenia Research,80(2): 283-293.

20. Corell C U, Lencz T, Smith C W, Auther. A M,et al (2005) Prospective study of adolescents with subsyndromal psychosis: Characteristics and outcome.Journal Of Child And Adolescent Psychopharmacology,15(3):418-33.

21. Done D J, Crow T J, Johnstone E C, Sacker A.(1994) Childhood antecedents of Schizophrenia and Affective illness- Social adjustment at ages 7 and 11. British Medical Journal,309: 699-703.

22. Eggers C.(1982)Psychosis in childhood and adolescence. Acta Paedopsychia,48:81-98.

23. Findling R L, Steiner H, Weller E.(2005) Use of antipsychotics in children and adolescents. Journal Of Clinical Psychiatry,66(7):29-40.

24. Findling R L.Juvenile onset Schizophrenia : Assessment,Neurobiology and Treatment. S Charles, Schulz,Eds.Baltimore (MD): John Hopkins University Press.

25. Fleischhaker C,Schulz E ,Tepper K.(2005) Long term course of adolescent Schizophrenia. Schizophrenia Bulletin,31(3):769-80.

26. Frazier J A, Giedd J N, Hamburger S D. (1996) Brain anatomic magnetic resonance in childhood-onset Schizophrenia. Archives Of General Psychiatry, 53(7): 617-624.

27. Goldberg T E,Karson T N, Leleszi J P,Weinberger D R.(1988) Intellectual impairment in Adolescents with psychosis: A controlled psychometric study. Schizophrenia Research,1(4):261-6.

28. Green W, Padron-Gayol M, Hardesty A S., et al.(1992).Schizophrenia with childhood onset: A phenomenological study of 38 cases. Journal Of American Academy of Child and Adolescent Psychiatry,35:968-976.

29. Gunnell D, Harrison G, Rassmusen F.(2002) Associations between Premorbid intellectual performance, early life exposures and early onset Schizophrenia. British Journal of Psychiatry 181:298-305.

30. Guz H, Dilloaz N.(2001) Clinical symptoms in Early onset and adult type of Schizophrenia. Yeni Symposium, 39(3) :155-159..

31. Hafner H, Nowotny B.(1995) Epidemiology of early onset Schizophrenia.European Archives Of Psychiatry And Clinical Neuroscience,245(2):80-92.

32. Hollis C. (2000) Adolescent Schizophrenia. Advances in Psychiatric Treatment,vol(6):83-93,2000.

33. Hollis C.(2003) Developmental precursors of child and adolescent onset Schizophrenia and affective psychosis; Diagnostic specificity and

continuity with symptom dimensions.British Journal of Psychiatry 182: 37-44.

34. Hollis C.(2000) Adult outcomes of child and adolescent onset Schizophrenia: Diagnostic stability and predictive validity. American Journal of Psychiatry 157:1652-1659.

35. Hollis C.(1995) Child and Adolescent onset Schizophrenia- A case control study of Premorbid developmental impairments. British Journal Of Psychiatry,166: 485-489.

36. Howard R, Castle D, Wessley S, Murray R.(1993) A comparative study of 470 cases of early onset and late onset Schizophrenia. British Journal Of Psychiatry ,163:352-357.

37. Illowsky B, Garvey M, Jacobsen L K.(2001) Abnormal neurological maturation in Adolescents with early onset Schizophrenia. American Journal Of psychiatry,158: 118-122.

38. Jacobsen L K ,Rapaport J L(1998) Research update: Childhood onset Schizophrenia: implications for clinical and neurobiological research. Journal Of Child Psychology and Psychiatry, 39:100-113.

39. Jarbin H, Von Knorring A L. (2003) Diagnostic stability in adolescent onset psychotic disorders. European Journal Of Child And Adolescent Psychiatry, 12(1): 15-22.

40. Joshi P T, Towbin K E. Chapter 45,Psychosis in Childhood and its Management. Neuropsychopharmacology:The fifth generation of Progress.

41. Kenny J T, Friedman L, Findling R L. (1997) Cognitive impairments in adolescents with Schizophrenia. American Journal Of Psychiatry,154: 1613-1615..

42. Kendler K S, Tsuang M T, Hays P.(1987) Age at onset in Schizophrenia- A familial perspective. Archives Of General Psychiatry, 44(10) : 881-890.

43. Kendler K S, Karowski-Shuman, Walsh D.(1996) Age at onset in Schizophrenia and risk of illness in relatives- results fron the Roscommon Family study. British Journal Of Psychiatry,169:213-218.

44. Kolvin I.(1971) Studies in childhood psychosis: Diagnostic criteria and classification.British Journal Of Psychiatry,118:381-384.

45. Kravarite E , Morris R G, Rabe-Hesketh S.(2003) Maudsley early onset Schizophrenia study: Cognitive function in adolescents with recent onset Schizophrenia. Schizophrenia Research,61(2):137-148.

46. Larsen T K, Friis S, Haahr U.,et al.(2004) First episode non affective psychosis: Distinct patterns of pre-onset course.British Journal of Psychiatry,185:108-115.

47. Lucas S, Fitzgerald D, Redobiado-Hodge A M.,et al(2004). Neuropsychological correlates of symptom profiles in first episode Schizophrenia. Schizophrenia Research,71(2):323-330.

48. McClellan J, Werry J.Practice parameters for assessment and treatment of children and adolescents with Schizophrenia- A review. Journal

of the American Academy of Child and Adolescent Psychiatry.Supplement:dec 2000.

49. McClellan J, Murray C, Speltz M L.(2002) Symptom factors in early onset psychotic disorders.Journal Of The American Academy Of Child And Adolescent Psychiatry,41(7):791-798.

50. McClellan J, Brieger D, McCurry C,Hlastala S.(2003) Premorbid functioning in early onset psychotic disorders.Journal Of The American Academy Of Child And Adolescent Psychiatry,42(6):666-672.

51. Makowski D, Waternaux C, Layonchere.C M,et al.(1997).Thought disorder in adolescents with Schizophrenia. Schizophrenia Research,23(2):147-165.

52. Matsumato H, Simmons A, Williams S.(2001) Superior temporal gyrus abnormalities in Early onset Schizophrenia: Similarities and differences with adult onset Schizophrenia.American Journal of Psychiatry,158:1299-1304

53. Mayer C, Kelterborn G, Naber D.(1993) Age of onset in Schizophrenia : Relation to psychopathology and gender. British Journal Of Psychiatry,44(10): 881-890.

54. Maziade M, Gingras N, Rodrigue C., et al (1996) Long term stability of diagnosis and symptom dimensions in a systematic sample of patients with onset of Schizophrenia in childhood and early adolescence: I nosology, sex and age of onset. British Journal Of Psychiatry, 169: 361-370.

55. Maziade M, Martinez M, Rodrigue C.(1997) Childhood/ early adolescence onset and adult Schizophrenia- Heterogeneity at Dopamine D3 R gene.British Journal Of Psychiatry,170: 27-30.

56. Myles- Worsley M.(2001) Adolescents with Schizophrenia, American Journal Of Psychiatry, 158:2095-96.

57. Nicolson R,Brookner F B,Lenane M (2003).Parental Schizophrenia spectrum disorders in childhood onset and adult onset Schizophrenia.American Journal Of Psychiatry,160(3):490-495.

58. Nicolson R,Rapoport J.(1999) Childhood onset Schizophrenia: Rare but worth studying.Biological Psychiatry,46:319:325.

59. Norman R M G,Malla A K.(2000).DUP:A critical examination of the concept and it's importance.Psychological medicine,31:381-400

60. Norman R M G, Lewis S W, Marshall M.(2005)Duration of untreated psychosis and its relation to clinical outcome.British Journal of Psychiatry,187 supplement 48:19-23.

61. Norman R M G,Malla A K, Manchanda R.,et al.(2005) Premorbid adjustment in first episode Schizophrenia and Schizoaffective disorder: a comparison of social and academic domains.Acta Psychiatrica Scandinavica,112(1):30-3.

62. Overall J,Gorham D.(1962) The brief psychiatric rating scale.Psychology Report,10:799-812.

63. Pearson G, Kregis L, Rabins P V. A chart review study of late onset and early onset Schizophrenia. American Journal of Psychiatry, 146: 1568-1574,1989.

64. Pulver A E,Brown C H, Wolyniec P.(1990)Schizophrenia: Age at onset,gender and familial risk.Acta Psychiatrica Scandinavica,82(5):344-351.

65. Rabinowitz J, Haim R, Reichenberg A.,et al (2005) Association between functioning in adolescence prior to first admission for Schizophrenia and affective disorders and pattern of hospitalization thereafter.Schizophrenia Research,73(2):185-191.

66. Reddy Y C, Girimaji S R, Srinath S.(1993) comparative study of classification of psychosis of child and adolescent onset. Acta Psychiatrica Scandinavica,87(3):188-191.

67. Remschmidt H.(2000) Early onset Schizophrenia: history of concept and recent studies. Indian Journal Of Behavioural Sciences,10(2): 11-22.

68. Remschmidt H.(2002) Early onset Schizophrenia as a progressive, deteriorating developmental disorder : Evidence from child psychiatry. Journal Of Neurotransmitters,109(1):101-17.

69. Ropcke B, Eggers C.(2005) Early onset Schizophrenia- A fifteen year follow up. European Journal of Child and Adolescent Psychiatry, 14: 341-350.

70. Russell A T,Bott L, Sammons C.(1989) The phenomenology of Schizophrenia occurring in childhood. Journal Of The American Academy Of Child And Adolescent Psychiatry,28(3):399-407.

71. Schaeffer J, Ross R G.(2002) Childhood onset Schizophrenia: Premorbid and prodromal diagnostic and treatment histories. Journal Of The American Academy Of Child And Adolescent Psychiatry,41(5):538-545.

72. Schmidt M,Blanz B, Dippe A.(1995) Course of patients diagnosed as having Schizophrenia during first episode occurring under age 18years.European Archives Of Psychiatry And Clinical Neuroscience,245(2):93-100.

73. Schultz S K ,Beng-Choon Ho, Andreasen N C.(2000)Clinical features characterizing young and intermediate onset Schizophrenia.Journal of Neuropsychiatry Clinical Neuroscience. 12:502-505.

74. Sharma I.(2005) Psychosis in children: What is our present state of knowledge. Journal Of Indian Association Of Child And Adolescent Mental Health,1(2):1.

75. Shimizu A, Kurachi M, Yamaguchi N.(1998) Does family history of Schizophrenia influence age of onset of Schizophrenia? Acta Psychiatrica Scandinavica,78(6):709-16.

76. Tengan S K, Maia A K.(2004) Functional psychosis in childhood and adolescence. Journal Of Paediatrics(Rio de Jenero), 80(2) supplement 0:11.

77. Thaden E , Rhinewine J P, Lencz T.(2006) Early onset Schizophrenia is associated with impaired adolescent development of attentional capacity using identical pairs continuous performance test. Schizophrenia Research,81(2):157-166.

78. Tolbert H A.(1996) Psychosis in children and adolescents: A review. Journal Of Clinical Psychiatry,57(supplement 3).

79. Volkmar F R.(1996) Childhood and adolescent onset psychosis: A review of past ten years.Journal Of The American Academy Of Child And Adolescent Psychiatry,35(7):843-851.

80. Volkmar F R, Tsatsanis K D. Childhood Schizophrenia.
Ed M.Lewis, Child and adolescent Psychiatry:A Comprehensive textbook.3rd edition.pg745-760.

81. Vourdas A, Pipe R, Corrigall R.(2003) Increased developmental deviance and premorbid dysfunction in early onset Schizophrenia. Schizophrenia Research,62(1):13-22.

82. Weinberger D R.(1987) Implications of normal brain development for pathogenesis of Schizophrenia. Archives Of General Psychiatry,44: 660-669.

83. Werry J S.(1992) Child and adolescent onset Schizophrenia: A review in the light of DSM III R. Journal of Autism and developmental disorders22(4):601-2

84. Werry J S, McClellan J M, Chard L.(1991) Childhood and adolescent onset Schizophrenia,Bipolar and Schizoaffective disorder: A clinical and outcome study. Journal Of The American Academy Of Child And Adolescent Psychiatry,30(3):457-465.

85. Yang P C, Liu C Y, Chiang S Q .(1995) Comparison of Adult manifestations of Schizophrenia with onset before and after 15 years of age. Acta Psychiatrica Scandinavica ,91(3) : 209-12.

APPENDIX

1. PROFORMA

Name: Age: Sex: Age of Onset:

Education :

Socioeconomic status: monthly income I . <1000 Rs II 1000- 5000 III > 5000

Duration of untreated psychosis(DUP):

Type of onset : A) acute B) insidious

Subtype of Schizophrenia:

2. BRIEF PSYCHIATRIC RATING SCALE (BPRS)

0= not present, 1=very mild, 2=mild, 3=moderate, 4=moderately severe, 5=severe, 6=extremely severe.

1. Somatic concern- preoccupation with physical health,fear of physical illness,hypochondriasis

2. Anxiety- worry,fear,overconcern for present or future

3. Emotional withdrawal- lack of spontaneous interaction, isolation, deficiency in relating to others

4. Conceptual disorganization- thought processes confused, disconnected, disorganized, disrupted.

5. Guilt feelings- Self blabe,shame,remorse for past behaviour.

6. Tension- physical and motor manifestations of nervousness, overactivation,tension

7. Mannerisms and posturing- peculiar, bizarre, unnatural motor behaviour

8.Grandiosity- Exaggerated self opinion, arrogance,conviction of unusual power or abilities

9. Depressive mood- sorrow,sadness, despondency, pessimism.

10. Hostility- animosity,contempt, belligerence, disdain for others.

11. Suspiciousness- mistrust, belief that others harbor malicious or discriminatory intent.

12. Hallucinatory behavior- Perceptions without normal external stimulus correspondence

13. Motor retardation- slowed, weakened movements or speech, reduced body tone

14. Uncooperativeness- resistance, guardedness, rejection of authority

15. Unusual thought content- unusual, odd, strange, bizarre thought content.

16. Blunted affect- reduced emotional tone, reduction in normal intensity of feelings, fatness

17. Excitement- heightened emotional tone, agitation, increased reactivity.

18. Disorientation- confusion or lack of proper association for person, place or time.

3. SCALE FOR ASSESMENT OF NEGATIVE SYMTOMS(SANS)

0=none, 1= questionable, 2=mild, 3=moderate, 4= marked,5=severe

Affective flattening or blunting

1. Unchanging facial expression- the patient's expression appears wooden, changes less than expected as emotional content of discourse changes.
2. Decreased spontaneous movements- the patient shows few or no spontaneous movements, does not shift position ,move extremities, etc
3. Paucity of expressive gestures- the patient does not use hand gestures, body position, etc as an aid to expressing his ideas.
4. Poor eye contact- the patient avoids eye contact or "stares through" interviewer even when speaking.
5. Affective nonresponsivity- the patient fails to smile or laugh when prompted
6. Lack of vocal inflections- the patient fails to show normal vocal emphasis patterns, is often monotonic.
7. Global rating of affective flattening- this rating should focus on overall severity of symptoms, especially unresponsiveness, eye contact, facial expression, and vocal inflections.

Alogia

8. Poverty of speech- the patient's replies to questions are restricted in amount, tend to be brief, concrete, and unelaborated.

9. Poverty of content of speech- the patient's replies are adequate in amount but tend to be vague, overconcrete, or over-generalized, and convey little information.

10. Blocking- the patient indicates , either spontaneously or with prompting, that his/her train of thought was interrupted.

11. Increased latency of response- the patient takes along time to reply to questions; prompting indicates that the patient is aware of the question.

12. Global rating of alogia- the core features of alogia are poverty of speech and poverty of content .

Avolition- apathy

13.Grooming and hygiene- the patient's clothes may be sloppy or soiled, and he/she may have greasy hair, body odour, etc.

14.Impersistence at work or school- the patient has difficulty seeking or maintaining employment, completing school work, keeping house etc. if an inpatient, cannot persist at ward activities, such as occupational therapy, playing cards, etc.

15. Physical anergia- the patient needs to be physically inert. He/she may sit for hours and does not initiate spontaneous activity.

16. Global rating of avolition – apathy – strong weight may be given to one or two prominent symptoms if particularly striking.

Anhedonia-asociality

17. Recreational interests and activities- the patient may have few or no interests. Both the quality and quantity of interests should be taken in to account.

18. Sexual activity- the patient may show a decrease in sexual interest and activity, or enjoyment when active.

19. ability to feel intimacy and closeness- the patient may display an inability to form close or intimate relationships, especially with opposite sex and family.

20. Relationships with friends and peers- the patient may have few or no friends and may prefer to spend all of his/her time isolated.

21. Global rating of anhedonia and asociality- this rating should reflect overall severity, taking in to account the patient's age, family status.

Attention

22. Social inattentiveness- the patient appears uninvolved or unengaged.

He/she may seem spacey.

23. Inattentiveness during mental status testing- test of serial sevens and spelling 'world' backwards.

24.Global rating of attention- this rating should assess the patient's overall concentration ,clinically and on tests.

4. SCALE FOR ASSESSMENT OF POSITIVE SYMPTOMS(SAPS)

0=none, 1= Questionable, 2= Mild, 3= Moderate, 4=Marked, 5= Severe

hallucinations

1. Auditory hallucinations – The patient reports voices, noises, or other sounds that no one else hears.
2. Voices commenting – The patient reports a voice which makes a running commentary on his/her behaviour or thoughts.
3. Voices conversing- The patient reports hearing two or more voices conversing.
4. Somatic or tactile hallucinations - The patient reports experiencing peculiar physical sensations in the body.
5. Olfactory hallucination - The patient reports experiencing unusual smells which no one else notices.
6. Visual hallucinations- The patient sees shapes or people that are not actually present.

7. Global rating of hallucinations – This rating should be based on the duration and severity of the hallucinations and their effects on the patient's life.

Delusions

8. Persecutory Delusions- The patient believes he/she is being conspired against or persecuted in some way.

9. Delusions of jealousy- The patient believes his/her spouse is having an affair with some one.

10. Delusions of guilt or sin- The patient believes that he/she has committed some terrible sin or done something unforgivable.

11. Grandiose Delusions- The patient believes that he/she has special powers or abilities.

12. Religious delusions- The patient is pre-occupied with false beliefs of a religious nature.

13. Somatic delusions- The patient believes that somehow his/her body is diseased, abnormal or changed.

14. Delusions of reference- The patient believes that insignificant remarks or events refer to him/her or have some special meaning.

15. Delusions of being controlled- The patient feels that his/her feelings or actions are controlled by some outside force.

16. Delusions of mind reading- The patient feels that people can read his/her mind or know his/her thoughts.

17. Thought broadcasting- The patient believes that his/her thoughts are broadcast so that he himself/ she herself or others ca hear them.

18. Thought insertion- The patient believes that thoughts that are not his/her own have been inserted into his/her mind.

19. Thought withdrawal- The patient believes that thoughts have been taken away from his/her mind.

20. Global rating of delusions- This rating should be based on the duration and persistence of the delusions and their effect on the patient's life.

Bizarre behaviour

21. Clothing and appearance- The patient dresses in an unusual manner or does other strange things to alter his/her appearance.

22. Social and sexual behaviour- The patient may do things considered inappropriate according to usual social norms.

23. Aggressive and agitated behaviour- The patient may behave in an aggressive, agitated manner; often unpredictably.

24. Repetitive or stereotyped behavoiur- The patient develops a set of repetitive actions or rituals that he/she must perform over and over.

25. Global rating of Bizarre behaviour- This rating should reflect the type of behaviour and the extent to which it deviates from social norms.

Positive formal thought disorder

26. Derailment- A pattern of speech in which ideas slip off , track on to ideas obliquely related or unrelated.

27. Tangentiality- Replying to a question in an oblique or irrelevant manner.

28. Incoherence- A pattern of speech which is essentially incomprehensible at times.

29. Illogicality- A pattern of speech in which conclusions are reached which do not follow logically.

30. Circumstantiality- A pattern of speech which is very indirect and delayed in reaching its goal idea.

31. Pressure of speech- A patient’s speech is rapid and difficult to interrupt; The amount of speech produced is greater than that considered normal.

32. Distractible speech- The patient is distracted by near by stimuli which interrupt his/her flow of speech.

33. Clanging- A pattern of speech in which sounds rather than meaningful relationships govern word choice.

34. Global rating of positive formal thought disorder- This rating should reflect the frequency of abnormality and degree to which it affects the patient's ability to communicate.

Inappropriate affect

35. Inappropriate affect- The patient's affect is inappropriate or incongruous, not simply flat or blunted.

PREMORBID ADJUSTMENT SCALE(Cannon-Spoor et al, 1982)

Childhood (Up through age 11)

1).Sociability and withdrawal

0. Not withdrawn, actively and frequently seeks out social contacts.

1.

2. Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.

3.

4. Moderately withdrawn, given to day dreaming and excessive fantasy, may passively allow self to be withdrawn into contact with others but does not seek it.

5.

6. Unrelated to others, withdrawn and isolated. Avoids contacts.

2). Peer relationships

0. Many friends, close relationships with several.

1.

2. Close relationships with a few friends.(1 or 2), casual friendship with others.

3.

4. Deviant friendship patterns: Friendly with children younger or older only, or relatives only or casual relationships only.

5.

6. Social isolate, no friends not even superficial relationships.

3.) Scholastic performance

0. Excellent student

1.

2. Good student

3.

4. Fair student

5.

6. Failing all classes

4.) Adaptation to School

0. Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.

1.

2. Fair Adaptation, occasional discipline problem, not very interested in school, but no truancy or rare. Has friends in school but does not often take part in extra curricular activities.

3.

4. Poor Adaptation, dislikes school, frequent truancy, frequent discipline problem.

5.

6. Refuses to have anything to do with school- delinquency or vandalism directed against school.

Adolescence (Early, ages 12-15)

1).Sociability and withdrawal

0. Not withdrawn, actively and frequently seeks out social contacts.

1.

2. Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.

3.

4. Moderately withdrawn, given to day dreaming and excessive fantasy, may passively allow self to be withdrawn into contact with others but does not seek it.

5.

6. Unrelated to others, withdrawn and isolated. Avoids contacts.

2). Peer relationships

0. Many friends, close relationships with several.

1.

2. Close relationships with a few friends.(1 or 2), casual friendship with others.

3.

4. Deviant friendship patterns: Friendly with children younger or older only, or relatives only or casual relationships only.

5.

6. Social isolate, no friends not even superficial relationships.

3.) Scholastic performance

0. Excellent student

1.

2. Good student

3.

4. Fair student

5.

6. Failing all classes

4). Adaptation to School

0. Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.

1.

2. Fair Adaptation, occasional discipline problem, not very interested in school, but no truancy or rare. Has friends in school but does not often take part in extra curricular activities.

3.

4. Poor Adaptation, dislikes school, frequent truancy, frequent discipline problem.

5.

6. Refuses to have anything to do with school- delinquency or vandalism directed against school.

5). Social-sexual aspects of life during early adolescence

0. Started dating, showed a “healthy interest” in the opposite sex, may have gone “steady”, may include some sexual activity.

1. Attachment and interest in others, may be same-sex attachments, may be a member of a group, interested in the opposite sex,although may not have close, emotional relationship with some one of the opposite sex, “crushes” and flirtations.

2. Consistent deep interest in same sex attachments with restricted or no interest in the opposite sex.

3.Casual same sex attachments, with inadequate attempts at relationships with the opposite sex. Casual contacts with both sexes.

4. Casual contact with the same sex, no interest in the opposite sex.

5. A loner, no or rare contacts with either boys or girls.

6. Anti-social, avoids and avoided by peers.(Differs from above in that an active avoidance of others rather than passive withdrawal is implied.)

Adolescence (Late, ages 16-18)

1)Sociability and withdrawal

0. Not withdrawn, actively and frequently seeks out social contacts.

1.

2. Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.

3.

4. Moderately withdrawn, given to day dreaming and excessive fantasy, may passively allow self to be withdrawn into contact with others but does not seek it.

5.

6. Unrelated to others, withdrawn and isolated. Avoids contacts.

2). Peer relationships

0. Many friends, close relationships with several.

1.

2. Close relationships with a few friends.(1 or 2), casual friendship with others.

3.

4. Deviant friendship patterns: Friendly with children younger or older only, or relatives only or casual relationships only.

5.

6. Social isolate, no friends not even superficial relationships.

3.) Scholastic performance

0. Excellent student

1.

2. Good student

3.

4. Fair student

5.

6. Failing all classes

4). Adaptation to School

0. Good adaptation, enjoys school, no or rare discipline problems, has friends at school, likes most teachers.

1.

2. Fair Adaptation, occasional discipline problem, not very interested in school, but no truancy or rare. Has friends in school but does not often take part in extra curricular activities.

3.

4. Poor Adaptation, dislikes school, frequent truancy, frequent discipline problem.

5.

6. Refuses to have anything to do with school- delinquency or vandalism directed against school.

5.) Social-sexual aspects of life during early adolescence

0. Always showed a “healthy interest” in the opposite sex, dating, has gone “steady”, engaged in some sexual activity(not necessarily intercourse).

1. Dated regularly. Had only one friend of the opposite sex with whom the patient went steady for a long time.(Includes sexual aspects of a relationship, although not necessarily intercourse; implies a twosome, pairing of into couples as distinguished from below).

2. Always mixed closely with boys and girls.(Involves membership in a crowd, interest in an attachment to others, no couples).

3. Consistent deep interest in same sex attachments with restricted or no interest in the opposite sex.

4.Casual same sex attachments, with inadequate attempts at adjustment to going out with the opposite sex. Casual contacts with boys and girls.

5. Casual contact with the same sex, lack of interest in the opposite sex.

6.No desire to be with boys and girls, never went out with opposite sex.

Adulthood (Age 19 and above)

1).Sociability and withdrawal

0. Not withdrawn, actively and frequently seeks out social contacts.

1.

2. Mild withdrawal, enjoys socialization when involved, occasionally seeks opportunities to socialize.

3.

4. Moderately withdrawn, given to day dreaming and excessive fantasy, may passively allow self to be withdrawn into contact with others but does not seek it.

5.

6. Unrelated to others, withdrawn and isolated. Avoids contacts.

2). Peer relationships

0. Many friends, close relationships with several.

1.

2. Close relationships with a few friends.(1 or 2), casual friendship with others.

3.

4. Deviant friendship patterns: Friendly with children younger or older only, or relatives only or casual relationships only.

5.

6. Social isolate, no friends not even superficial relationships.

3).Aspects of adult social-sexual life

A. Married, presently or formerly:

0. Married, only one marriage (or remarried as a death of spouse) living as a unit , adequate sexual relations.

1. Currently married with history of low sexual drive, periods of difficult sexual relations, or extra marital affair.

1. Married, more than one time, currently remarried, adequate sexual relations during at least one marriage.

2. Married, or divorced and remarried, chronically inadequate sexual life.

2. Married and apparently permanently separated or divorced without remarriage, but maintained a home in one marriage for at least 3 years.

B. Never married over 30:

2. Has been engaged one or more times or has had a long term relationship (at least 2 years) involving heterosexual or homosexual relations, or apparent

evidence of a love affair with one person but unable to achieve long term commitment such as marriage.

3. Long term heterosexual or homosexual relationship lasting over six months but less than two years.

4. Brief or short term dating experiences with one or more partners, but no long lasting sexual experience with a single partner.

5. Sexual and/or social relationships rare or infrequent.

6. Minimal sexual or social interest in either men or women, isolated.

General

1).Education

0. Completed college and/or graduate school, or professional school.

1. Completed high school and some college or vocational training school or business school.

2. Completed high school.

3.

4. Completed eighth grade.

5.

6. Did not get beyond fifth grade.

2). During a period of 3 years up to 6 months before first hospitalization or onset of first episode, patient was employed for pay of functioning in school.

0. All the time

1.

2. Half the time

3.

4. Briefly, about 25% of time.

5.

6. Never

3).Within a period of a year up to six months before first hospitalization or first episode, change in work or school performance occurred

0. Abruptly

1.

2. With in 3 months

3.

4. With in 6 months

5.

6. Imperceptibly, difficult or not possible to determine onset of deterioration.

4) During a period of 3 years up to 6 months before first hospitalization or onset of first episode, frequency of job change , if working , or interruption of school attendance was

0. Same job held, or remained in school

1.

2. Job change or school interruption occurred 2-3 times

3.

4.Kept the same job more than 8months but less than a year, or remained continuously in school for the same period.

5.

6.Less than 2 weeks at a job or in school.

5)Establishment of independence

0. Successfully established residence away from family home, financially independent of parents.

2.Made unsuccessful attempts to establish independent residence, lives in parents home, but pays parents room and board, otherwise financially independent.

4.Lives in parents' home receiving an allowance from parents which patient budgets to pay for entertainment, clothes etc.

6.made no attempt to leave home or be financially independent.

6).Global assessment of highest level of functioning achieved in patient's life.

0.Fully able to function successfully in and take pleasure from 1)school or job 2)friends 3) intimate sexual relationships 4) church,hobbies,etc. Enjoys life and copes with it well.

2.Able to function well in and enjoys some spheres of life, but has a definite lack of success in at least one area .

4. Minimum success and pleasure in three areas of life.

6. Unable to function in or enjoy any aspect of life.

7)Social-personal adjustment.

0. A leader or officer in formally designated groups, clubs, organizations, or athletic teams in senior high school, vocational school, college, or young adulthood. Involved in intimate, close relationship with others.

1.An active and interested participant, but did not play a leading role in groups of friends, clubs, organizations, or athletic teams, but was involved in close relationships with others also.

2.A nominal member, but had no involvement or commitment to, groups of friends, clubs, organizations, etc. Had close relationships with a few friends.

3.From adolescence through early adulthood had a few casual friends.

4.From adolescence through early adulthood had no real friends, only superficial relationships.

5.From adolescence through early adulthood(i.e. after childhood),quiet, seclusive ,preferred to be by self, minimal efforts to maintain any contact at all with others.

6.No desire to be with peers or others. either asocial or antisocial.

8)Degree of interest in life.

0.Keen,ambitious interest in some of the following: home,family,friends,work,sports,art,pets,gardening,social activities, music, and drama.

2.Moderate degree of interest in several activities including social gatherings, sports, music, and opposite sex.

4.Mild interest in a few things such as job,family,quiet social gatherings. The interest is barely sustaining.

6.Withdrawn and indifferent towards life interests of average individual. No deep interests of any sort.

9)Energy level

0.Strong drive,keen,active,alert interest in life. Liked life and had energy enough to enjoy it. outgoing and adequate in meeting life.

2.Moderately adequate drive,energy,interest, as described above.

4.Moderately inadequate energy level. Tended toward submissive, passive reactions. Showed some potential to face life's problems, but would rather avoid them than expend the energy necessary.

6.Submissive , inadequate, passive reactions. Weak grasp on life, dies not go out to meet life's problems, does not participate actively, but passively accepts his lot without having the energy to help self.

5. GLOBAL ASSESSMENT OF FUNCTIONING SCALE

Consider psychological, social, and occupational functioning on a hypothetical continuum of mental health- illness. Do not include impairment in functioning due to physical, or environmental limitations.

91-100 Superior functioning in a wide range of activities, life's problems never seem to get out of hand, is sort out by others because of his or her positive qualities. No symptoms.

81-90 Absence or minimal symptoms, good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, no more than every day problems or concerns.(e.g., an occasional argument with family members.)

71-80 If symptoms are present they are transient and expectable reactions to psycho social stressors: no more than slight impairment in social, occupational or school functioning.(Temporarily falling behind in school work).

61-70 Some mild symptoms(e.g. depressed mood and mild insomnia) OR some difficulty in social, occupational, school functioning, but generally functioning pretty well, has some meaningful interpersonal relationships.

51-60 Moderate symptoms (e.g. flat affect and circumstantial speech, occasional panic attacks) OR moderate difficulty in social, occupational or school functioning.(e.g., few friends, conflicts with peers or co-workers)

41-50 Serious symptoms(e.g., suicidal ideation, severe obssesional rituals, frequent shop lifting) OR any serious impairment in social, occupational or school functioning(eg.,No friends , unable to keep a job).

31-40 Some impairment in reality testing or communication(e.g., speech is at times illogical, obscure, or irrelevant) OR major impairment in several areas ,such as work or school, family relations, judgement, thinking, or mood(depressed man avoids friends, neglects family and is unable to work; child frequently beats up younger children and is defiant at home, and is failing at school).

21-30 Behaviour is considerably influenced by delusions or hallucinations OR serious impairment in communication or judgement(e.g., sometimes incoherent, acts grossly inappropriately, suicidal preoccupation) OR inability to function in almost all areas(stays in bed almost all day; no job, home or friends)

11-20 Some danger of hurting self or others(suicidal attempts without clear expectation of death, frequently violent, manic excitement) OR occasionally fails to maintain personal hygiene OR gross impairment in communication (e.g., largely incoherent or mute)

1-10 Persistent danger of severely hurting self or others (recurrent violence) OR persistent inability to maintain minimal personal hygiene OR serious suicidal act with clear expectation of death.

6. FAMILY HISTORY RESEARCH DIAGNOSTIC CRITERIA FOR SCHIZOPHRENIA

A through C are required

A. No prominent symptoms of an over lapping mood disturbance.

B. At least one of the following

1. Delusions
2. Hallucinations
3. Incoherence
4. Grossly bizarre behaviour(e.g.; carries faeces around in the pocket)

C. Evidence of an illness that lasted at least one year from which he never recovered, i.e., continued to show significant signs of the illness(e.g., impaired functioning, blunted affect, social withdrawal).

FIGURE 1:AGE DISTRIBUTION

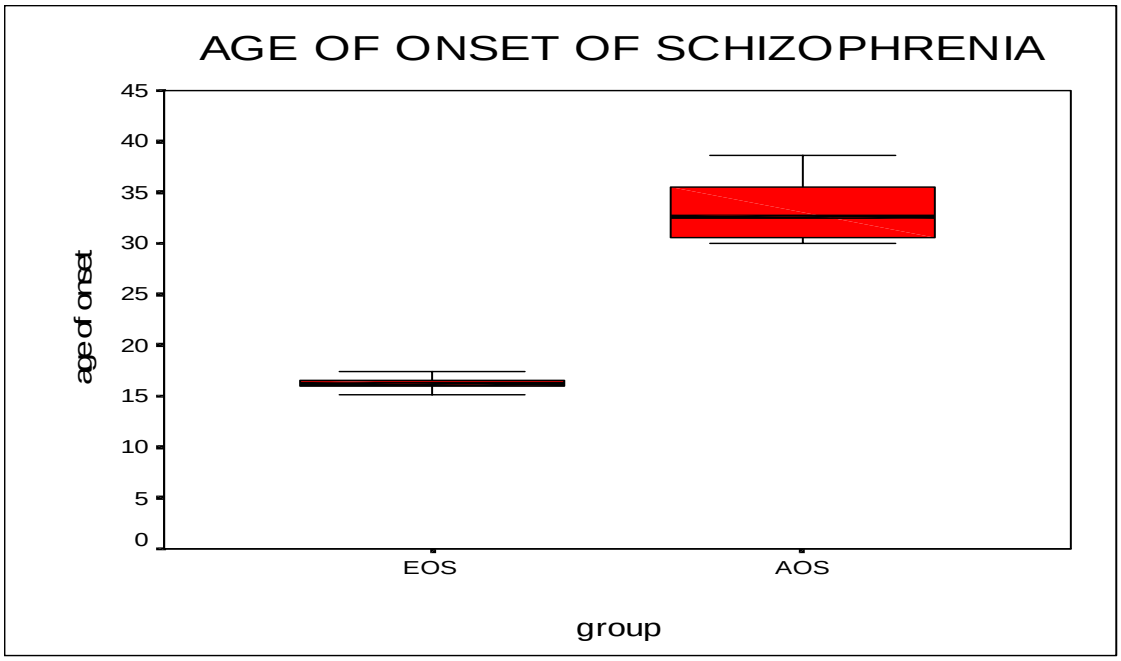

FIGURE 2: COMPARISON OF TYPE OF ONSET

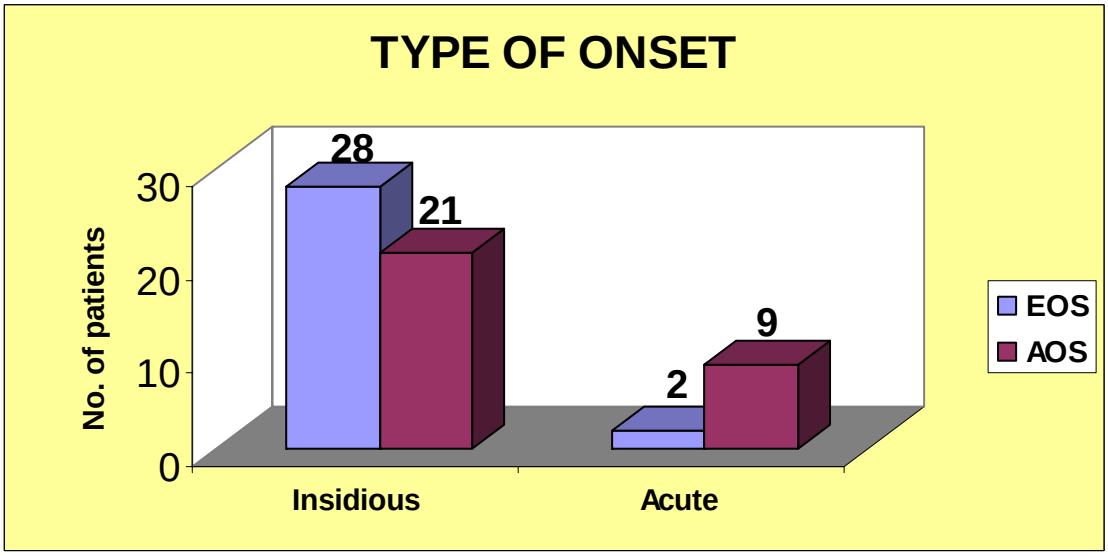

FIGURE 3: COMPARISON BASED ON SUBTYPE OF SCHIZOPHRENIA

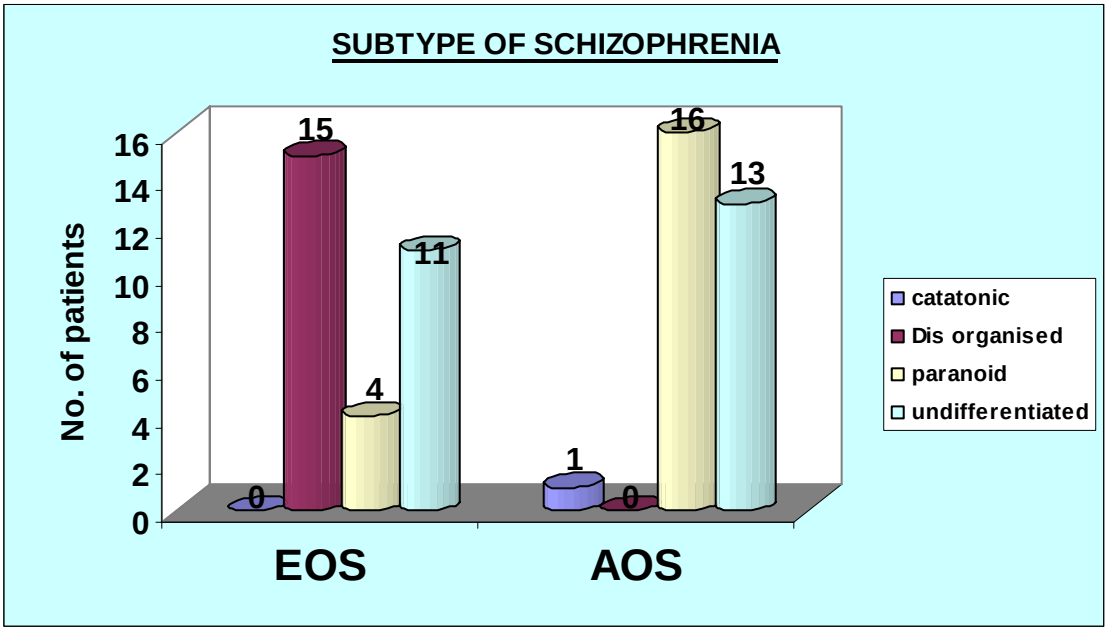

FIGURE 4: COMPARISON OF SAPS SCORES

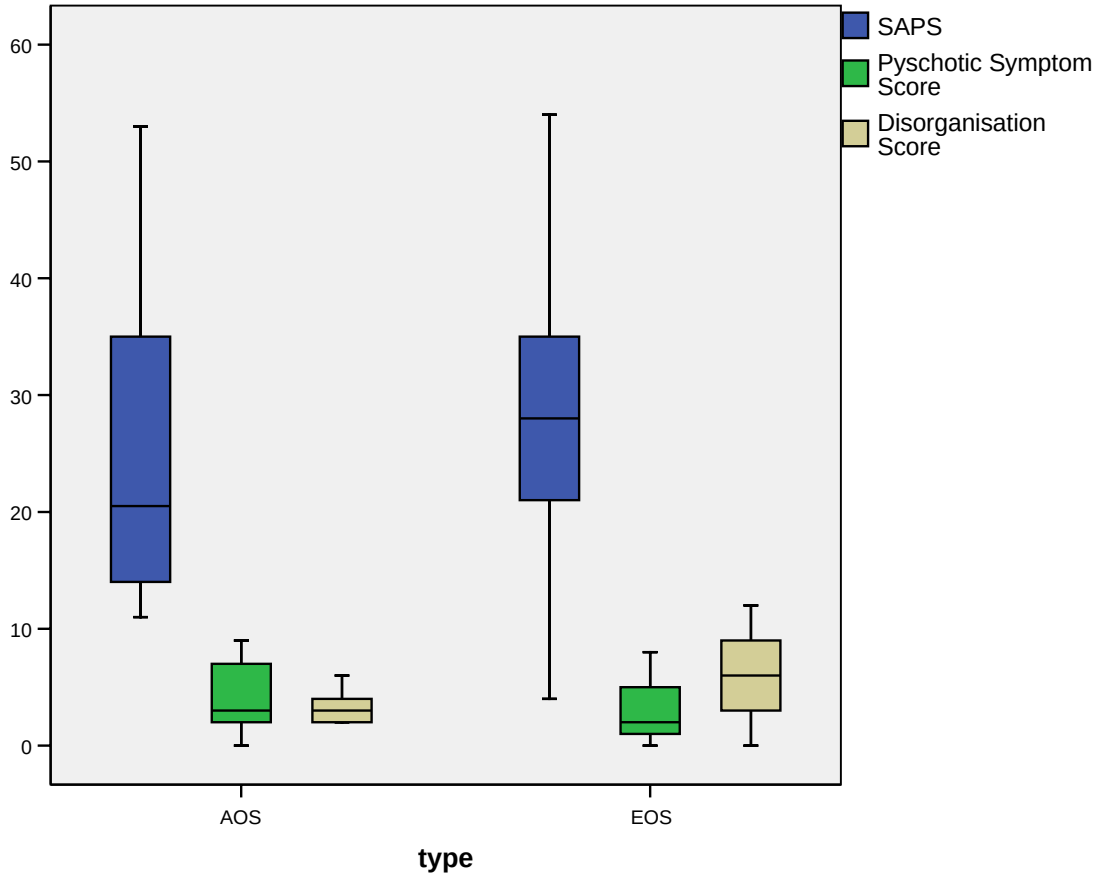

FIGURE 5 :COMPARISON OF SANS SCORES

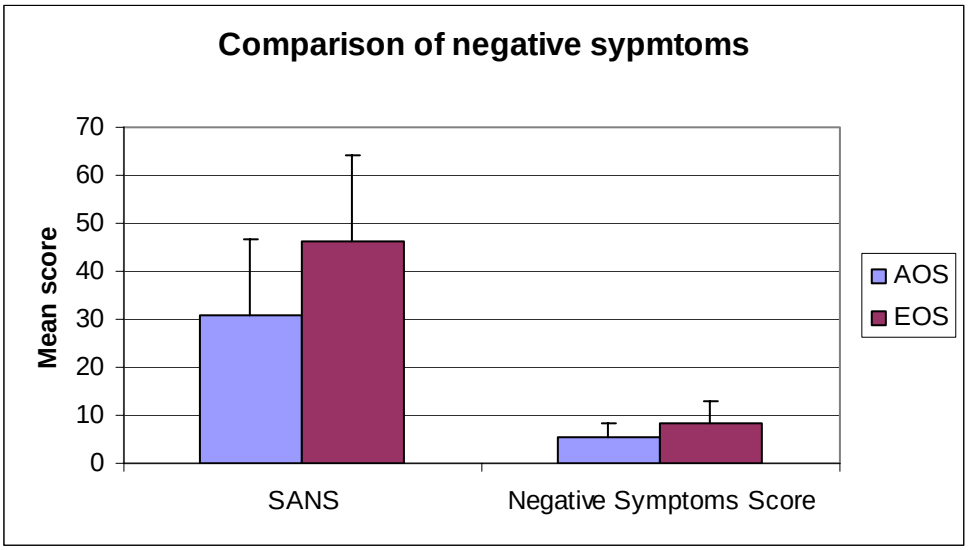

FIGURE 6 : COMPARISON OF NEGATIVE SYMPTOMS AND SEVERITY OF ILLNESS BASED ON FAMILY HISTORY